Lower Oak Grove Fish Habitat Improvement Project

1992 ANNUAL REPORT

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ABSTRACT

In 1992, the Clackamas Ranger District completed project work on about 0.50 miles of stream. About 50 structures were installed in the 1992 project reach. As in 1991, the 1992 work used a helicopter to ferry materials to the structure locations and a hydraulic spyder to place the rocks and logs into the desired configurations. The helicopter ferried 830,000 pounds of rock, logs, and miscellaneous materials into the stream valley in 7 hours of flight time. Biological monitoring of the lower Oak Grove Fork showed that no spring chinook salmon spawned in the river in 1992, but there were at least 20 winter steelhead redds in the lower 2 miles. In addition, monitoring juvenile fish use showed that one of the structure pools contained the same species ccmposition and in similar densities as a natural pool with good cover.

TABLE OF CONTENTS

Description of project area.....1

Introduction.....1

Methods and materials.....2

Results and discussion.....3

Summary and conclusions.....3

DESCRIPTION OF PROJECT AREA:

The Oak Grove Fork of the Clackamas River is a fifth order tributary of the Upper Clackamas River (T.6S., R.6E., Sec. 3). The stream supports runs of early (hatchery origin) and native late-run coho and spring chinook salmon, and summer and winter steelhead. The native late-run coho salmon and native winter steelhead have declined from historical levels. These two stocks are now ccnsidered at a moderate risk of extinction (Nehlsen, et al., 1991). Thus, this project could benefit these two stocks by increasing the quantity and quality of habitat available to them.

The Oak Grove Fork basin area is 140 square miles and mainstem length is 21 miles, all on National Forest System lands. Anadromous fish migration is limited to the lower 4.0 miles of the Oak Grove Fork. Access above this point is blocked by a waterfall that exceeds 20 feet in height.

Portland General Electric (PGE) diverts the entire flow of the Oak Grove Fork at Harriet Dam (river mile 4.8) to the generation facilities at Three Lynx. Stream flow of the Oak Grove Fork above Harriet is regulated for power production all year. Leakage from Harriet Dam and tributary inflow provides the only flow in the Oak Grove Fork downstream of the dam for most of the year. There is no provision for minimum flows from Harriet Lake to the Lower Oak Grove Fork, nor is there any facility or mechanism to provide any outflow. Minimal leakage at the base of Harriet dam (estimated to be less than 1 cubic foot per second (CFS)) and inflow from several second order tributaries located in the first mile below the dam (Sam, Skunk, and Canyon Creeks) provide an additional 5 to 9 CFS of flow during low flow periods. Thus, the total flow in the lower Oak Grove Fork in low flow periods is 10 CFS or less.

Smolt production *is* presently estimated *to* be below *average* for a Clackamas River tributary. Spawning habitat is of marginal quality and low in quantity, averaging only 130 square yards per stream mile (1982 survey) because of the impoundments upstream. Fisheries habitat inventories of the Lower Oak Grove Fork show the stream to have limited pool, and deep glide habitats. The pool habitat available is generally characterized as shallow with little effective ccver . Off channel habitat is available, but generally shallow with limited flow to support fish rearing.

INTRODUCTION

In 1986 habitat enhancement activities were initiated in the lower most stream reach, river mile- (RM) 0.25 to 0.75. This resulted in the development of a 1050-foot-long side channel (1825 square yards of rearing habitat) and a boulder berm/cluster structure which was placed in 1650 feet of the mainstem. Additional enhancement sites were identified in 1987 in the middle and upper reaches of the Lower Oak Grove Fork. Specific project plans were developed for these sites in coordination with the Oregon Department of Fish and Wildlife (ODF&W) and PGE fisheries biologists. Clackamas Ranger District personnel prepared the associated environmental assessment documents. Post-project monitoring of the 1986 project reach sites was also completed during the 1587/88 work agreement period. Delays during fiscal year 1988 prevented implementation of the project.

During 1989, the Lower Oak Grove Fork was surveyed using the Hankin-Reeves stream survey methodology. This methodology was chosen for it's repeatability in out-years. The stream was surveyed from the mouth to the impassable falls at RM 4.0. The results of this survey indicate that spawning gravels and large woody debris are lacking throughout the system. Results also indicate that active side channels composed 26 percent of the parallel stream length at the flow levels during the 1989 survey. The 1989 results are slightly different from previous survey results in that side channels made up more of the available habitat. Since the amount of side channel habitat is a function cf discharge, the quantity and quality of side channel habitat available to juvenile anadromous fish varies with discharge.

In October 1990 the Forest Service initiated work in the lower section of stream RM 0.25-O-37. Approximately 15 structures were created utilizing heavy equipment for placement. Four trees from the existing riparian area were cut down and approximately 5 existing down trees were imported to the site. This wood was used to make cross-channel structures and wing-deflectors for gravel catchxnents and rearing areas. Boulders from the channel were anchored to the pieces of wood to hold them in place and to provide diversity to the structures. Smaller pieces of wood were incorporated into existing pools tc provide cover for rearing and spawning salmonids.

In 1991, the Forest Service constructed about 80 structures between RM 1.25 and 3.0 by hauling in about 300 boulders and 120 logs. No riparian trees were felled to create the structures. A pre-project survey was completed on this section of river in 1991 prior to project implementation. In 1993, we plan to conduct a post-project survey on the same reach to determine if our project objectives were met.

METHODS AND MATERIALS

In 1992, the Forest Service continued implementing the preferred alternative selected from the 1990 environmental assessment. The 1992 project area was in the reach between RM 0.75 and 1.25. As in 1991, the project required using non-traditional equipment due to difficult access. The project reach has few access points or roads paralleling the river. Therefore, the Forest Service used a helicopter to ferry materials into the river channel and a hydraulic spyder placed the material into the desired configurations. From there a crew attached the rocks with cables to the logs.

In order to fly the rocks into the channel, the crew pre-drilled the rocks and glued the cables at the landing. Loops were created in the cables with clamps. The helicopter lifted the rocks by attaching to the loops. Out of about 133 rocks (averaging 2,500 pounds each) less than 5 of the cables pulled free cf the rocks and 3 were lost when the rocks twisted and snapped the cables.

The helicopter ferried 830,000 pounds of rock, logs, and miscellaneous materials into the channel in 7 hours of flight time. Many of the round traps took 3 minutes or less. Some of the structure sites were about 1 mile from the landings. All totaled, over 50 structures were created using about 133 boulders and about 133 log pieces. The log pieces were hauled to the landings from trees cut during the construction of a hydroelectric project located about

10 miles upstream of the project area. Therefore, no riparian trees were felled to create the structures.

In May, June, and October of 1992, survey crews conducted a spawning survey in the lower 2 miles of the Oak Grove Fork. In July and August of 1992, survey crews electroshocked and snorkeled habitat units to look at juvenile fish composition and use.

RESULTS AND DISCUSSION

The structure work in 1992 resulted in the creation of numerous large pools. These large deep pools can be used for juvenile rearing and adult holding. In addition to this, the cross channel structures provide good spawning areas for anadromous fish at the tail outs of the downstream pools and the shallow areas at the upstream portions of the structures. One thing different about the 1992 structures was the focus of including angled cover logs in the large pools.

In addition to the large pools, numerous cover logs were placed in the channel. These cover logs act as deflectors to break up the velocity of the water, allowing juvenile anadromous fish to locate at their downstream sides.

The 1992 spawning surveys showed that no spring chinook salmon spawned in the Oak Grove Fork compared to about 30 pairs in 1991. One plausible explanation is the reduced escapement. The escapement dropped from a recent record of 4,500 fish in 1991 to 3,500 fish in 1992 (an approximately 25 percent decrease) to the Clackamas River basin upstream of North Fork dam. Spawning surveys in May and June located about 20 winter steelhead redds in the lower 2 miles of the Oak Grove Fork.

In July and August of 1992, a volunteer group of students under the guidance of District fishery biologists electroshocked a pool created by a 1990 structure and a natural pool with a root wad in the center (Table 1). Both pools contained approximately equal numbers of juvenile coho salmon and juvenile steelhead/rainbow trout based on electrofishing. It should be noted that the structure pool was considerably deeper than the natural pool. The root wad in the natural pool made collecting stunned fish difficult. The depth of the structure pool and the root wad affected the effectiveness of the electrofishing. Thus, the estimates for the number and species of fish in the structure pool can be considered minimum estimates. Snorkeling observations of the structure pool showed that greater than 40 coho salmon lived in the pool throuthout July and the first part of August. In addition, 5 adult spring chinook salmon were observed holding in the same pool.

Table 1. Number of fish collected by electroshocking in two pools of the Oak Grove Fork of the Clackamas River, July and August. 1992.

Species	Structure Pool	Natural Pool
Coho salmon	19	16
Steelhead/ Rainbow trout:		
· <70 mm fork length	13	7
· >70 mm fork length	4	11
Spring chinook salmon (Adult)	5*	

* Observed snorkeling but not collected by electroshocking.

SUMMARY AND CONCLUSIONS

Since 1990, the Forest Service completed habitat improvement work on 2.75 miles cf the Oak Grove Fork (RM 0.25 to RM 3.0). Over 150 structures were created at 75 sites and only 5 trees were cut from the riparian zone. The remainder of the trees were imported from trees that blew down in upland areas in the January, 1990 windstorm or trees cut for construction of the Stone Creek hydroelectric project.

The biological monitoring to date, shows that spring chinook salmon, coho salmon, and winter steelhead spawned in gravel areas associated with the structures. These new gravel accumulations are very desirable as the pre-project conditions had very little spawning gravel due to the impoundments upstream.

The habitats created by the structures held high concentrations of juvenile fish of the same species. Thus, the structures were successful at creating conditions favorable to juvenile anadromous fish. Further habitat monitoring will allow complete evaluation of the change in habitat composition.

REFERENCES

Nehlsen, W., J.E. Williams, and J.A. Lichatowich. 1991. Pacific salmon at the crossroads: stocks at risk from California, Oregon, Idaho, and Washington. Fisheries: 16: 4-21.